

What is claimed is:

1. A steam engine for converting thermal energy into mechanical energy at an output portion, comprising:

a fluid container for flowably containing fluid;

a heater for heating the fluid contained in the fluid container; and

a cooler for cooling steam vaporized by being heated by the heater, the cooler being disposed below the heater in a direction of gravity's acceleration,

wherein expansion pressure of the steam displaces flowing liquid to output the mechanical energy, and the cooler cools and liquefies the steam to displace the fluid contained in the fluid container with self-excited vibration.

2. The steam engine according to claim 1, further comprising:

exciting means disposed proximate to the heater, the exciting means applying periodical exciting force to the fluid contained in the fluid container.

3. The steam engine according to claim 2, wherein the exciting force is a reaction force of a compression of gas charged in a gastight enclosure, and the exciting means applies the exciting force to the fluid contained in the fluid container.

4. The steam engine according to claim 2, wherein the

exciting means applies force to the fluid contained in the fluid container in a cycle out of phase with a cycle of the self-exciting vibration generated in the fluid container.

5. The steam engine according to claim 2, wherein the exciting means applies force to the fluid contained in the fluid container in a cycle one-quarter cycle out of phase with a cycle of the self-exciting vibration generated in the fluid container.

6. The steam engine according to claim 4, wherein the exciting means comprises:

a first gas chamber for containing a gas for directly applying the exciting force to the fluid contained in the fluid container; and

a second gas chamber coupled to the first gas chamber via throttle means for generating a predetermined flowing resistance.

7. The steam engine according to claim 1, wherein a regenerator is provided between the heater and the cooler, and the regenerator exchanges heat in the fluid contained in the fluid container.

8. The steam engine according to claim 1, wherein the fluid container is approximately formed in the shape of a U so that a bent pipe is positioned in the lowermost part thereof,

and liquid is displaced back and forth in the bent pipe with self-excited vibration.

9. The steam engine according to claim 1, wherein the fluid container is formed in a double cylindrical shape so as to have an outer cylinder and an inner cylinder coupled to each other in the lower portions thereof, and fluid is displaced back and forth in a coupling tube for coupling the outer cylinder and the inner cylinder with self-excited vibration.

10. A steam engine for converting thermal energy into mechanical energy, comprising:

a fluid container forming a fluid path;

a heater for heating fluid contained in the fluid container;

a cooler disposed above the heater, the cooler cooling steam vaporized by being heated by the heater; and

an output portion provided in the fluid container, the output portion outputting displacement of self-excited vibration generated in liquid contained in the fluid container as the mechanical energy.

11. The steam engine according to claim 10, further comprising:

flow rate control means for periodically varying the flow rate of the fluid circulating through the fluid container.

12. The steam engine according to claim 10, wherein the fluid container formed in a double cylindrical shape has an outer cylinder and an inner cylinder coupled to each other in upper and lower portions thereof.

13. The steam engine according to claim 1, wherein the cooler and the heater are disposed separately from each other in the direction of gravity, and the output portion is provided proximate to the cooler.

14. The steam engine according to claim 1, wherein the output portion has any one of a piston and bellows displaced with vibration, output is taken out of the piston or bellows, the piston or bellows receives pressure from flowing liquid.

15. The steam engine according to claim 4, wherein force is applied to the fluid contained in the fluid container in the cycle out of phase, to extend time for heat exchange between the heater or the cooler and the fluid.